CLAIMS

We Claim:

1   1.   A system for identifying and classifying images,

2   comprising:

3   a training set comprising a plurality of sample image pose

4   normalized images;

5   means for inputting an input image to be classified or

6   identified and storing the input image;

7   an image pose normalizer for image pose normalizing the input

8   image to produce an image pose normalized input image;

9   means for comparing the image pose normalized input image to

10   each of the plurality of sample image posed normalized images; and

11   means for displaying at least one of the plurality of sample

12   images which most closely corresponds to the input image.

1   2.   The system of claim 1, wherein said means for comparing

2   the image pose normalized input image to each of the plurality of

3   sample image posed normalized images comprises:

4   a   Normalized   Vector   Difference   (NVD)   algorithm,   for

5   determining differences between the image posed normalized input

6   image and the plurality of sample image posed normalized images.

1   3.   The system of claim 2, wherein said training set

2 comprising a plurality of image pose normalized images is generated

3 from a training set including a plurality of sample images pre-

4 processed to remove effects of rotation and scale.

1   4.   The system of claim 3, wherein said training set

2 comprising a plurality of image pose normalized images is further

3 generated by defining a region of interest in each of the plurality

4 of sample images and normalizing the region of interest for each of

5 the plurality of sample images.

1   5.   The system of claim 4, wherein said training set

2 comprising a plurality of image pose normalized images is further

3 generated by converting an image representation for each of the

4 plurality of sample images from cartesian coordinates to polar

5 coordinates to produce a corresponding plurality of sample image

6 pose normalized image for each of the plurality of sampled images.

1   6. The system of claim 5, wherein said image pose normalizer

2 for image pose normalizing the input image comprises:

3   means for by processing to remove effects of rotation and

4 scale by defining a region of interest in the input image.

1   7.   The system of claim 6, wherein said image pose normalizer

2   for image pose normalizing the input image further comprises:

3   means for normalizing the region of interest for the input

4   image.

1   8.   The system of claim 7, wherein said image pose normalizer

2   for image pose normalizing the input image further comprises:

3   means for converting the input image representation from

4   cartesian coordinates to polar coordinates to produce an image pose

5   normalized input image.

1   9.   A method for identifying and classifying images,

2   comprising the steps of:

3   generating a training set comprising a plurality of sample

4   image pose normalized images;

5   inputting an input image to be classified or identified and

6   storing the input image;

7   image pose normalizing, using an image pose normalizer, the

8   input image to produce an image pose normalized input image;

9   comparing the image pose normalized input image to each of the

10   plurality of sample image posed normalized images; and

11   displaying at least one of the plurality of sample images

12   which most closely corresponds to the input image.

1   10.   The method of claim 9, wherein said step of comparing the

2   image pose normalized input image to each of the plurality of

3   sample image posed normalized images comprises the steps of:

4   determining, using a Normalized Vector Difference (NVD)

5   algorithm, differences between the image posed normalized input

6   image and the plurality of sample image posed normalized images.

1   11.   The method of claim 10, wherein said step of generating

2   a training set comprising a plurality of image pose normalized

3   images comprises the step of:

4   generating, from a training set, a plurality of sample images

5   pre-processed to remove effects of rotation and scale.

1   12.   The method of claim 11, wherein said step of generating

2   a training set comprising a plurality of image pose normalized

3   images further comprises the steps of:

4   defining a region of interest in each of the plurality of

5   sample images, and

6   normalizing the region of interest for each of the plurality

7   of sample images.

1   13. The method of claim 12, wherein said step of generating

2   a training set comprising a plurality of image pose normalized

3   images further comprises the step of:

4   converting an image representation for each of the plurality

5   of sample images from cartesian coordinates to polar coordinates to

6   produce a corresponding plurality of sample image pose normalized

7   image for each of the plurality of sampled images.

1   14. The method of claim 13, wherein said step of image pose

2   normalizing the input image comprises the step of:

3   processing to remove effects of rotation and scale by defining

4   a region of interest in the input image.

1   15. The method of claim 14, wherein said step of image pose

2   normalizing the input image further comprises the step of:

3   normalizing the region of interest for the input image.

1   16. The method of claim 15, wherein said step of image pose

2   normalizing the input image further comprises the step of:

3   converting the input image representation from cartesian

4   coordinates to polar coordinates to produce an image pose

5   normalized input image.

1   17.   A method for identifying and classifying images,

2   comprising the steps of:

3   inputting an input image to be classified or identified and

4   storing the input image;

5   image pose normalizing, using an image pose normalizer, the

6   input image to produce an image pose normalized input image;

7   comparing the image pose normalized input image to each of a

8   plurality of sample image pose normalized images in a stored

9   training set comprising the plurality of sample image posed

10   normalized images; and

11   displaying at least one of the plurality of sample images

12   which most closely corresponds to the input image.

1   18.   The method of claim 17, wherein said step of comparing

2   the image pose normalized input image to each of the plurality of

3   sample image posed normalized images comprises the steps of:

4   determining, using a Normalized Vector Difference (NVD)

5   algorithm, differences between the image posed normalized input

6   image and the plurality of sample image posed normalized images.

1   19.   The method of claim 18, wherein the training set

2   comprising a plurality of image pose normalized images is generated

3   by:

4   generating, from a training set, a plurality of sample images

5   pre-processed to remove effects of rotation and scale.

1   20.   The method of claim 19, wherein the training set

2   comprising a plurality of image pose normalized images is further

3   generated by:

4   defining a region of interest in each of the plurality of

5   sample images, and

6   normalizing the region of interest for each of the plurality

7   of sample images.

1   21.   The method of claim 20, wherein the training set

2   comprising a plurality of image pose normalized images is further

3   generated by:

4   converting an image representation for each of the plurality

5   of sample images from cartesian coordinates to polar coordinates to

6   produce a corresponding plurality of sample image pose normalized

7   image for each of the plurality of sampled images.

1   22.   The method of claim 21, wherein said step of image pose

2   normalizing the input image comprises the step of:

3   processing to remove effects of rotation and scale by defining

4   a region of interest in the input image.

1   23.   The method of claim 22, wherein said step of image pose

2 normalizing the input image further comprises the step of:

3   normalizing the region of interest for the input image.

1   24.   The method of claim 23, wherein said step of image pose

2 normalizing the input image further comprises the step of:

3   converting the input image representation from cartesian

4 coordinates to polar coordinates to produce an image pose

5 normalized input image.

1   25.   A computer-readable media containing a series of program

2 instructions for controlling the computer for identifying and

3 classifying images, said program instructions comprising:

4   an instruction for an instruction for inputting an input image

5 to be classified or identified and storing the input image;

6   an instruction for image pose normalizing, using an image pose

7 normalizer, the input image to produce an image pose normalized

8 input image;

9   an instruction for comparing the image pose normalized input

10 image to each of a plurality of sample image pose normalized images

11 in a stored training set comprising the plurality of sample image

12 posed normalized images; and

13   an instruction for displaying at least one of the plurality of

14 sample images which most closely corresponds to the input image.

1   26.   The a computer-readable media containing a series of

2   program instructions for controlling the computer of claim 25,

3   wherein said instruction for comparing the image pose normalized

4   input image to each of the plurality of sample image posed

5   normalized images comprises:

6   an instruction for determining, using a Normalized Vector

7   Difference (NVD) algorithm, differences between the image posed

8   normalized input image and the plurality of sample image posed

9   normalized images.

1   27.   The a computer-readable media containing a series of

2   program instructions for controlling the computer of claim 26,

3   wherein the training set comprising a plurality of image pose

4   normalized images is generated by:

5   generating, from a training set, a plurality of sample images

6   pre-processed to remove effects of rotation and scale.

1   28.   The a computer-readable media containing a series of

2   program instructions for controlling the computer of claim 27,

3   wherein the training set comprising a plurality of image pose

4   normalized images is further generated by:

5   defining a region of interest in each of the plurality of

6   sample images, and

7   normalizing the region of interest for each of the plurality

8   of sample images.

1   29.   The a computer-readable media containing a series of

2   program instructions for controlling the computer of claim 28,

3   wherein the training set comprising a plurality of image pose

4   normalized images is further generated by:

5   converting an image representation for each of the plurality

6   of sample images from cartesian coordinates to polar coordinates to

7   produce a corresponding plurality of sample image pose normalized

8   image for each of the plurality of sampled images.

1   30.   The a computer-readable media containing a series of

2   program instructions for controlling the computer of claim 29,

3   wherein said instruction for image pose normalizing the input image

4   comprises:

5   an instruction for processing to remove effects of rotation

6   and scale by defining a region of interest in the input image.

1   31.   The a computer-readable media containing a series of

2   program instructions for controlling the computer of claim 30,

3   wherein said instruction for image pose normalizing the input image

4   further comprises:

5   an instruction for normalizing the region of interest for the

6   input image.

1   32. The a computer-readable media containing a series of

2   program instructions for controlling the computer of claim 31,

3   wherein said instruction for image pose normalizing the input image

4   further comprises:

5   an instruction for converting the input image representation

6   from cartesian coordinates to polar coordinates to produce an image

7   pose normalized input image.